

Serial No. 10/771,047 Page 7

REMARKS

Claims 1, 5 – 8, 10, 11, 13, 16, 17, 20 – 24, 26 – 29, 31 – 40, 43 – 45 are presently pending. Claims 10, 11, and 13 were withdrawn from consideration. Claims 1 and 5 – 7 were rejected under 35 U.S.C. § 102(b) as being anticipated by Corcoran. Claim 8 was rejected as being unpatentable over Corcoran in view of Waarts. Claims 16, 17, 20 – 24, and 26 – 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Corcoran in view of Craig *et al.* (574). Claim 22 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Corcoran in view of Craig *et al.* and further in view of Feillens *et al.* Claims 29, 31 – 33 and 36 – 38 under 35 U.S.C. § 103(a) as being unpatentable over Corcoran in view of Jiang *et al.* ('997). Claim 45 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Corcoran in view of Jiang *et al.* in view of Hough. Claims 34 and 35 were rejected as being unpatentable over Corcoran in view of Jiang and further in view of Waarts *et al.*

Applicants are appreciative of the telephonic interview afforded to Applicant (Kalin Spariousu), Applicants' Attorney (William J. Benman), and Assignee's representatives (Leonard A. Alkov and Ragu Reghunathan) on March 2, 2010.

During the interview, Mr. Benman set forth Applicants' arguments for allowability of the Claims and Mr. Spariousu provided input as to the nonobvious aspects of the invention as claimed relative to the prior art. Examiner Nguyen raised several questions and cited a reference to Zelevsky (U.S. patent application number 2007/0273957). After some discussion, the Examiner suggested certain amendments to the Claims. (In this connection, the Examiner's Interview Summary mailed March 10, 2010 is accurate.) Accordingly, by this Paper, the Examiner's suggestions have been incorporated into the Claims. Specifically, Claims 1 and 29 have been amended to include limitations directed to the use of beam flattening optics characterized by a **hexagonal geometry**. This limitation was included in Claims 20 and 45. Consequently, these Claims have been canceled.

Serial No. 10/771,047 Page 8

In addition, previously withdrawn Claims 10 and 11 have been reinstated for consideration as these Claims were withdrawn in response to an election of species requirement and Claim 1, as amended, is deemed to be generic. Further, previously withdrawn Claim 13 has been canceled as per a restriction requirement.

The subject Application is therefore deemed to be in proper form for allowance. Accordingly, reconsideration, allowance and passage to issue are respectfully requested.

As noted previously, the present invention addresses the need in the art for an eye-safe, high-quality, robust, cost-effective, compact, and light-weight laser that is readily scalable to high average power and high pulse energy and for a unique phase-locking system that can efficiently combine arbitrary numbers of fiber laser oscillator outputs without requiring precise fiber length equalization or stringent periodic positioning.

The need in the art is addressed by the inventive laser which includes plural fiber laser oscillators, high-power laser pump sources coupled to said fiber laser resonators, and a cavity external to the fiber laser oscillators coherently combines plural laser beams output from the plural fiber laser oscillators into a single output laser beam. The invention is set forth in Claims of varying scope of which Claim 1, as amended, is illustrative. Claim 1 now recites:

1. A robust scalable eye-safe laser system comprising:
a plurality of laser fibers, said laser fibers including double-clad Er:YAG laser resonators;
a high-power laser pump source coupled to each of said laser fibers; and
an external cavity having an optical axis, and beam-flattening optics characterized by a hexagonal geometry for flattening individual Gaussian-like TEM_{00} beams into top hat laser beams and forming a combined beam symbolized by a random phase and amplitude multiple beam profile, said external cavity having a first lens, a single aperture, a second lens and a mirror located along the optical axis, said single aperture being of predetermined diameter and being located at focal points of the first and the second lenses. (Emphasis added.)

None of the references, taken alone or in combination, teach or render obvious the invention as presently claimed. That is, none of the references, taken alone or in combination, teach or render obvious a laser system having plural fiber laser resonators,

Serial No. 10/771,047 Page 9

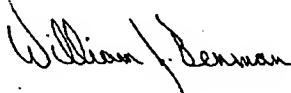
high power pump sources coupled to the fiber laser resonators, an external cavity for combining the outputs thereof into a single output beam and beam flattening optics **characterized by a hexagonal geometry** for flattening individual Gaussian-like TEM₀₀ beams into top hat laser beams and forming a combined beam symbolized by a random phase and amplitude multiple beam profile as presently claimed.

As noted above, Claim 1 now includes the additional limitation of Claim 20. Claim 20 was rejected as being unpatentable over Corcoran in view of Craig. The Examiner acknowledged that the references did not teach beam-flattening optics characterized by hexagonal geometry. Nonetheless, the Examiner suggested that it was well known in the art to use hexagonal geometry of optics to save space and reduce the loss of laser intensity. However, as discussed extensively during the telephonic interview on March 2, 2010, it was not known in the art at the time of the filing of the Application, nor presently, to use hexagonal geometry in connection beam flattening optics. Inasmuch as this was acknowledged by the Examiner during the interview, and Claim 29 has been amended to include the salient limitation to hexagonal geometry, the present Claims should be allowable.

Accordingly, the subject Application is deemed to be in proper form for allowance. Reconsideration, allowance and passage to issue are respectfully requested.

Respectfully submitted,
K. Spariosu *et al.*

By



William J. Benman
Attorney for Applicants
Registration No. 29,014

Benman, Brown & Williams
2049 Century Park East, Suite 2740
Los Angeles, CA 90067

(310) 553-2400
(310) 553-2675 facsimile